



**STATE OF MONTANA  
MONTANA DEPARTMENT OF TRANSPORTATION  
JOB PROFILE**

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Update

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Formal Review

**Date Submitted 6/3/2013**

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***SECTION I - Identification***

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**Working Title:**

Aerial Remote Sensing Data Acquisition Specialist/  
Aerial Sensor Operator

**Department:**

Transportation

**Job Code Number:**

131856

**Division & Bureau:**

Highways and Engineering Division  
Highways Bureau

**Job Code Title:**

Project Facilitation Specialist

**Section & Unit:**

Photogrammetry and Survey Section, Air  
Photo Unit

**Pay Band:**

6

**Work Address:**

2701 Prospect Avenue  
Helena, MT 59620  
(406) 444-6322

**Position Number:**

27003

**Phone:**

406-444-6322

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FLSA Exempt

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FLSA Non-Exempt

☐

Non-Union

☒

MPEA

☐

Blue Collar

**Profile Completed By:**

Bryce Larsen

**Work Phone:**

406-444-6321

***Work Unit Mission Statement or Functional Description:***

The Montana Department of Transportation's (MDT) mission is to serve the public by providing a transportation system and services that emphasize quality, safety, cost effectiveness, economic vitality and sensitivity to the environment.

The Highways and Engineering Division prepares projects for bidding and coordinates highway construction. The division is made up of the Preconstruction and Construction programs and five District Construction Offices in Missoula, Butte, Great Falls, Glendive, and Billings for budget and workforce purposes. Preconstruction functions are administered by the Highways, Right of Way, Bridge, Consultant Design, and Traffic and Safety bureaus; and the Engineering Information Services Section.

The Highways Bureau is responsible for planning and developing the details of construction projects. This includes determining the location and design features, details, quantities and costs; conducting public meetings and working with local officials; and evaluating, approving and incorporating requested design modifications into the plans during the right-of-way acquisition and permitting phases. The Bureau is made up of diverse programs in the Road Design, Hydraulics, and Photogrammetry & Survey Sections. The Bureau is also responsible for liaison of Tort Claims filed against MDT.

The Photogrammetry and Survey Section is responsible for MDT's photogrammetry, survey and aerial photo/airborne remote sensing programs. The Air Photo Unit is responsible for airborne remote sensing operations including acquisition of aerial photography/airborne remote sensing data, developing and maintaining an aerial film library/database, and producing and providing quality aerial photographic/aerial sensor products in support of MDT's photogrammetry, engineering, maintenance and planning entities as well as the general public.

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***Describe the Job's Overall Purpose:***

This position serves as the Aerial Remote Sensing Data Acquisition Specialist/Aerial Sensor Operator and as the sole employee of the Air Photo Unit, is accountable for all its functions. Duties include: developing air photo/airborne remote sensing program standards, methods and procedures; determining project timelines, approaches and estimated costs; planning, prioritizing and scheduling projects; providing budgeting information to agency management; and evaluating program methods and procedures for the purpose of ensuring quality control. The position is responsible for air photo/airborne remote sensing data acquisition, determining the scope of project assignments, scheduling projects, planning and conducting flight missions, and operating aerial sensors to obtain quality, cost effective remote sensing data for the MDT. The work also involves the operation and oversight of the department's aerial photo laboratory, processing film, manipulating and making prints from digital imagery, testing and calibrating specialized photo equipment, purchasing equipment and supplies, incorporating graphic art components into special assignments, developing and maintaining photo archive and retrieval systems, and conducting a variety of specialized public assistance work on behalf of the department.

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***SECTION II - Major Duties or Responsibilities***

*This section should be a clear concise statement of the position's major duties*

*And the approximate percent of work time for each duty*

***% of Time***

- |  |            |
|--|------------|
| <b>A. <u>Program Management and Development</u></b>  | <b>50%</b> |
| <p>This position is responsible for the on-going management and development of the Photogrammetry &amp; Survey Section's air photo/airborne remote sensing data acquisition program. The incumbent researches, develops, implements, and monitors program standards, procedures, methods and operational guidelines and plans and coordinates the airborne remote sensing data acquisition services for a broad range of MDT functions .</p>   |            |
| <ol style="list-style-type: none"><li>1. Researches state-of-the-art aerial photo/airborne remote sensing systems, techniques and technologies (e.g. – digital aerial camera systems, LiDAR systems, IMU systems, flight management systems, digital image management systems, etc.). Studies and analyzes impacts and benefit/cost of these systems for potential use and implementation at the MDT. Identifies justifiable systems, techniques and technologies and coordinates with management and others (e.g. – ISD, Aircraft Unit, Engineering, etc.) to secure funding, purchase and implement approved systems.</li><li>2. Develops, implements and evaluates maintenance schedules, processes and procedures for complex, expensive aerial photo/remote sensing equipment by taking into account manufacturer recommendations, MDT usage, industry standards and governmental requirements.</li></ol> |            |

3. Researches, develops, establishes, and implements operational procedures and processes for aerial photo/airborne remote sensing data acquisition and associated processing functions based on analysis and assessment of client needs and priorities, professional methods and standards, safety standards and requirements, changing technology and remote sensing program goals and objectives.
4. Documents established processes and standards by developing instruction sheets, help guides or including information in the *MDT Survey Manual*.
5. Evaluates and assesses aerial photo/airborne remote sensing data acquisition processes and procedures for effectiveness, to identify operational inefficiencies, resolve problems and to ensure consistency of aerial products. Develops and documents QA/QC standards for aerial photo/airborne remote sensing data acquisition based on evaluation processes and procedures.
6. Establishes work schedules for multiple projects taking into consideration competing priorities and resources. Potential considerations include: MDT project schedules (planning, design and construction), emergencies/natural disasters (floods, fires, avalanches), outside requests (law enforcement, other state agencies, special studies, etc.), aircraft availability, remote sensing acquisition parameters, cost constraints, etc.
7. Develops specific work plans for each aerial photo/remote sensing data acquisition project by evaluating acquisition requests, assessing project parameters and constraints and by determining and/or customizing methods and approaches to be used.
8. Administers remote sensing term contracts and reviews work of consultants. Work involves setting up and overseeing individual term contract assignments by developing scope of work documents, developing cost estimates, negotiating costs with consultants, obtaining authorization, issuing notice-to-proceed, reviewing invoices, entering term contract information into the CIS database, reviewing data for quality and compliance to standards/contractual requirements and by approving or rejecting submitted data.
9. Provides long range plans and budget information. This consists of providing information for the preparation of biennial budgets based upon anticipated program needs and requirements. It involves evaluating and forecasting expenditures based on factors such as historical expenses for supplies, maintenance, planned new equipment procurement, equipment replacement needs, on-going program activities, current vendor and supplier costs, upcoming projects, new technology and other factors.

**B. Operations and Professional/Technical Duties**

**45%**

This position is responsible for ongoing operations of the unit as well as performing a number of technical and professional duties. Many of these responsibilities involve scheduling, coordination with others, determining final products to be produced, making professional judgments and performing technical duties. These responsibilities require a knowledge of project planning and sequencing, specialized technical and professional applications related to the air photo/remote sensing field, MDT methods and process, MDT quality control requirements, operation and maintenance of specialized equipment, operation of computer equipment and software programs and industry standards and practices.

1. Performs professional and technical duties related to aerial photo/remote sensing operations including but not limited to the following:

- Installing, uninstalling, operating and maintaining aerial camera /remote sensing data acquisition equipment (i.e. - Wild RC30).
- Operating and maintaining an aerial film processor (i.e. - Versamat 11C-M).
- Acquiring aerial imagery by exposing and developing aerial film to MDT specifications.
- Performing QA/QC analysis of aerial film and other remote sensing data acquisition products.
- Labeling, indexing and microfilming rolls of aerial film.
- Scanning rolls of aerial film.
- Assembling and downloading aerial image metadata into an image database or related software application.
- Developing and executing plans for remote sensing data acquisition missions.
- Determining and purchasing appropriate parts and supplies including: aerial films, aerial film processing chemicals, graphic art materials, control strips, equipment parts, etc.
- Reprinting aerial images and developing miscellaneous graphic arts products using specialized photo programs, printers, mounting presses, etc.
- Operating, testing, calibrating and maintaining aerial photo/remote sensing and associated equipment.
- Operating software programs such as standard office software, specialized photo software, remote sensing equipment software, database software, etc.
- Developing and managing project lists and schedules.

**D. Other Duties as Assigned**

**5%**

Performs a variety of other professional and technical duties in support of the on-going development, management and operation of MDT's aerial photo/remote sensing data acquisition program and Photogrammetry & Survey Section.

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1. ***The following duties and/or specific tasks listed under section II above are considered "essential functions" because they require specialized expertise and skill and are the primary reasons the job exists (they must be performed by this position with or without accommodations):***

Project Management and Development  
Operations and Professional/Technical Duties

***The following mental and physical demands are associated with these essential functions:***

**PHYSICAL**

- Lifting objects up to 100 lbs.
- Extensive travel throughout the state to project locations
- Operating a personal computer
- Communicating in writing, in person and over the phone
- Dealing with the public on a regular basis
- Continual walking or standing
- Demands for accuracy in all aspects of work
- Use of photography tools, equipment, and photo chemicals
- Computing arithmetic operations
- Comparing data
- Operation of motor vehicles
- Ability to multi-task

- Ability to meet inflexible deadlines
- Interpersonal skills/behaviors
- Fly at high altitudes for extended periods of time
- Fly at high altitudes requiring the use of oxygen for extended periods of time
- Maintain focus, concentration, and accuracy while experiencing turbulent flying conditions
- Maneuver in confined spaces while shooting film

#### **MENTAL**

- Deal with the on an as-needed basis
- Ability to multi-task
- Demands for accuracy in all aspects of work
- Ability to meet inflexible deadlines
- Initiative and accountability
- Research and problem solving
- Computing arithmetic operations
- Comparing data
- Compiling information
- Prioritize
- Analyzing
- Coordinating
- Synthesizing
- Instructing

2. Does this position supervise others? ☐ Yes ☒ No

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#### ***SECTION III - Minimum Qualifications - List minimum requirements for the first day of work.***

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##### **Critical knowledge and skills required for this position:**

**KNOWLEDGE:** This position requires knowledge of the theory, principles and practices of aerial remote sensing data acquisition including aerial photography, a wide variety of applications of photography and photographic laboratory procedures; knowledge and skill in the operation of highly specialized aerial cameras/airborne remote sensing systems and related equipment including GNSS equipment, IMU equipment, specialized aerial photo lab equipment, photo chemistry and photo finishing; knowledge of program management and planning; knowledge of mathematics, weather, navigation, and geography; knowledge of graphic arts methods and techniques; working knowledge of photogrammetry, engineering and surveying principles and practices; and a working knowledge of the limitations of aircraft and related safety issues and concerns.

**SKILLS:** Considerable skill in the use and operation of aerial cameras/airborne remote sensing systems, use of film processing equipment, photo editing, graphics arts techniques and the operation and use of computer equipment and software.

##### **Behaviors required to perform these duties:**

See MDT Core Behaviors

**Education:**

Check the one box indicating minimum education requirements for this position for a new employee the first day of work:

- |   |  |
|---|--|
| <input type="checkbox"/> No education required                | <input type="checkbox"/> Related AAS/2-years college/vocational training |
| <input type="checkbox"/> High school diploma or equivalent    | <input checked="" type="checkbox"/> Related Bachelor's Degree            |
| <input type="checkbox"/> 1-year related college/voc. training | <input type="checkbox"/> Related Master's degree                         |

**Please specify the acceptable fields of study:**

Bachelor's degree in photography, remote sensing, geosciences, geomatics or related field is desired.

**Other education, training, certification, or licensing required (specify):**

**Experience:**

Check the one box indicating minimum work-related experience requirements for this position for a new employee the first day of work:

- |   |   |
|---|---|
| <input type="checkbox"/> No prior experience required | <input checked="" type="checkbox"/> 3 years |
| <input type="checkbox"/> 1 year                       | <input type="checkbox"/> 4 years            |
| <input type="checkbox"/> 2 years                      | <input type="checkbox"/> 5 or more years    |

**Other specific experience (optional):** three (3) years of experience in aerial photography/remote sensing data acquisition and aerial photo/remote sensing data acquisition program management.

**Alternative Qualifications:**

This agency will accept alternative methods of obtaining necessary qualifications.

☒ Yes ☐ No

**Alternative qualifications include:**

May consider equivalent combinations of education and/or experience.

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***SECTION IV – Other Important Job Information***

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|--|--|
| <input type="checkbox"/> Fingerprint check | <input checked="" type="checkbox"/> Valid driver's license |
| <input type="checkbox"/> Background check  | <input type="checkbox"/> Other; Describe                   |

Other information including working conditions such as shifts, lifting requirements, travel or hours.

This position works in an office setting, photographic laboratory and in an aircraft. The work requires long periods of standing in the photo lab or darkroom; withstanding physical demands of flying while being free from air motion sickness; periodic use of oxygen while acquiring high altitude remote sensing data; loading aerial sensor equipment in excess of 100lbs. into a confined aircraft; working in small, confined spaces while acquiring remote sensing data from an aircraft; and exposure to chemicals associated with photography work.

Statewide travel in an aircraft is required. Travel may involve an occasional overnight trip. Willingness to flex assigned standard work schedule to accommodate periodic weekend or holiday airborne remote sensing missions is required.

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**SECTION V – Signatures**

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Signature indicates this statement is accurate and complete.

***Employee:***

Name: \_\_\_\_\_ Title: \_\_\_\_\_

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

***Immediate Supervisor:***

Name: \_\_\_\_\_ Title: \_\_\_\_\_

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

***Bureau Chief:***

Name: \_\_\_\_\_ Title: \_\_\_\_\_

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

***Division/District Administrator:***

Name: \_\_\_\_\_ Title: \_\_\_\_\_

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

***Department Designee:***

Brent Rabe/Designee

Human Resources Administrator  
Human Resources Division

Signature: \_\_\_\_\_ Date: \_\_\_\_\_